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MAY—JUNE 1981
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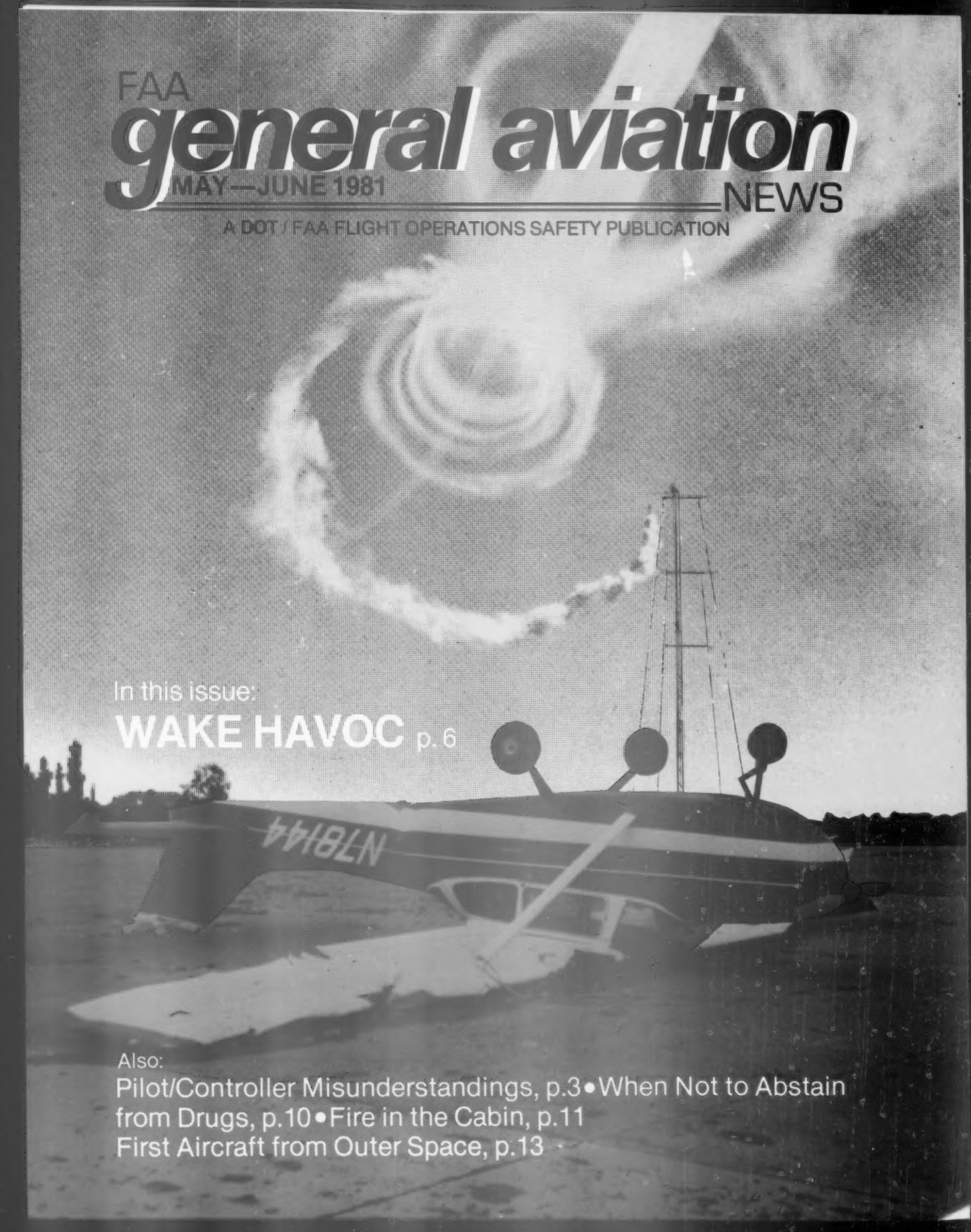

In this issue:

WAKE HAVOC p. 6

Also:
Pilot/Controller Misunderstandings, p.3 • When Not to Abstain from Drugs, p.10 • Fire in the Cabin, p.11
First Aircraft from Outer Space, p.13

FAA GENERAL AVIATION NEWS

**DEPARTMENT OF TRANSPORTATION/
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MAY–JUNE 1981
Volume 20, Number 3

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BRIEFS

TURBO AND TURBINE. Serious and fatal accidents have occurred when fuel attendants mistakenly fueled turbo-charged aircraft with turbine (jet) engine fuel. The error may slip past the pilot if the fuel is number-coded only on the sales slip. In addition to the normal preflight inspection of your fuel tanks, take the trouble to read fuel sales slips and make sure you understand what the numbers mean. You could be signing away your life.

MISSED CONNECTION. Petroleum-based spray solvents are good cleaners for many types of aircraft equipment, but not for electrical connectors. An investigation of several incidents where connectors shorted out revealed they had been sprayed with such a solvent to clean connector joining surfaces. The solvent had seeped through insulation into wiring and evaporated, leaving an oily, dirty film called a "carbon track" that caused the short. Mere traces of this film can short out some aviation electrical equipment.

AIRBORNE CAMERAS. A non-approved installation of a camera mount on the top wing of a homebuilt aircraft almost led to dramatic photos of the plane's demise. In slow flight the airflow obstruction caused an inadvertent stall and roll-over. The pilot was obliged to land at above-normal speed. External camera mounts on any aircraft should be installed only by qualified persons.

COST OF LANDING. Prices of Government-issued Airport/Facility Directories have risen. An annual subscription for the books covering all seven regions of the U.S. and updated every 56 days is now $55.00. A year's subscription for one region is $14.50, and a single book for any region is $3.00. Send check or money order to National Ocean Survey, Distribution Division C-44, Riverdale, MD 20840.

A BIT OF ALL RIGHT. Pilots considering flying a private aircraft in Great Britain this summer may be interested in a free booklet from British Airports called Airport Information for General Aviation. The pocket-sized pamphlet has diagrams of seven major airports in England and Scotland and shows the locations of general aviation ramps. It also gives customs and immigration procedures, landing fees, fuel on hand, radio frequencies, etc. Write British Airports Publications, Brochure Department, Wellington Road, Cheriton, Folkestone, Kent, England.

MIS-ANTICIPATION

A Key to Pilot/Controller Misunderstandings

The history of air traffic control dates back to the early 1920's, when communication was limited to hand signals or night fires and flares. Misunderstandings between pilots and ground stations were unavoidably frequent. Today, some 60 years later, widespread use of two-way radios and computer assisted radar would appear to all but eliminate the possibility of error.

Anyone who flies extensively will tell you this is not so. Mistakes still do occur—quite infrequently, considering the hundreds of thousands of radioed transmissions that take place everyday. Over a recent 15 month period, more than 5,500 anonymous reports were filed concerning conditions experienced or observed in flight which cited pilot/controller misunderstandings as responsible for potentially hazardous situations. How is this possible? *Equipment failure? Pressure from heavy traffic flow? Interference? Linguistic problems?*

All of the above, to some extent, but none predominantly. Most air traffic control facility chiefs will tell you that mistakes—on the rare occasion when they do happen—are more likely to result from *mis-anticipation.* Typically the error occurs in a fairly relaxed situation and involves a very routine exchange of information. What happens is that the pilot, or the controller (sometimes both) *thinks* he hears what he expects to hear and proceeds accordingly.

An example of mis-anticipation took place recently at Dulles International Airport in northern Virginia, when a Cessna 421 was being radar vectored for a practice instrument approach to runway 19L. After leaving Shawnee VOR the aircraft was assigned an altitude and a heading for radar vectors to Manne intersection. The instructor pilot acknowledged the clearance, read it back, and then told his student, ". . . heading 010, descend to and maintain 10,000 feet." The student was flying the aircraft under a hood. The instructor was a veteran ex-Marine flyer who had been giving instrument instruction at Dulles day after day for months, virtually always with that same clearance.

As they descended to nearly 11,000 feet, Dulles

Approach Control called to verify their altitude. They were immediately cleared to climb to 12,000 and maintain visual separation from a Boeing 727 level at 10,000 feet, flying the same heading. The instructor took over the controls, and a landing was accomplished without further incident. Both pilots assumed ATC had made a mistake, but a subsequent review of the tapes from Dulles Tower covering their transmission with the 421 showed that 12,000 feet was the altitude assigned *and readback by* the instructor. He had *heard* 12,000 feet but "understood" 10,000 because that was what he anticipated.

Another form of mis-anticipation occurs when information a pilot is expecting does not arrive during the period expected, and the pilot changes course or altitude in a manner he assumes will be approved.

A recent incident of this kind occurred when a B-707 was making an approach to JFK at night during marginal IFR weather conditions. An approach controller assigned the captain an altitude of 2,700 feet and a heading that would require him to fly over midtown Manhattan before beginning his final approach course. The captain, not clearly understanding the controller's instructions, called Approach Control several times for altitude clarification but received no answer. On his own initiative the pilot began a descent to 1,500 feet, the altitude for the outer marker for landing on runway 13. This altitude on his heading placed the aircraft's flight path in line with a skyscraper whose upper television antenna rises over 1,700 feet. The controller, who was handling seven other aircraft at the same time, became aware of the 707's potentially dangerous situation when the Minimum Safe Altitude Warning light began flashing at the aircraft's data block on the radar scope. He immediately advised the aircraft to turn and climb to 3,000 feet. The aircraft was then resequenced and landed safely at JFK.

Pilots should realize that as workload and weather conditions vary, controller techniques may also vary, but this is no reason for assuming the controller is neglecting your aircraft. A pilot should always be prepared to take action on his own when conditions concerning the safety of his aircraft require it, but second-guessing a controller—especially in IFR weather—is a dangerous game.

If you believe action on your own initiative is imperative, radio your intentions—the message may be heard even if it is not acknowledged. If the frequency is blocked, use another—even 121.5 if the situation appears to be of an emergency nature.

One occasional cause of air-to-ground misunderstanding can easily be avoided: the use of non-standard phraseology, either by pilot or controller. Non-standard phraseology means anything from casual language to jive talk or slang. Slang is colorful and sometimes amusing but may be misleading. ("Neat" for example, in modern parlance can mean virtually anything *but* "tidy.") There is no room for guesswork in air traffic control phraseology.

Controllers are trained to use specific words and phrases which may sound stilted at times but which pinpoint their meaning; and experienced pilots usually adhere to the same kind of language. If someone, in a relaxed mood, falls into a slangy mode, there is no need for his respondent to go along with it. One small ambiguity can lead to a very large collision.

A general aviation pilot who flies regularly into the Los Angeles basin for a commuter airline related the following example of just how dangerous non-standard phraseology can be. He had landed his twin turboprop on runway 25L and needed to go to a gate on the far side of the parallel runway 25R. As he rolled along the taxiway between the two runways, Local Control called and said, "*King Air* 785 Delta, keep a watch out 'cause heavies are taking off on 25 right." Not hearing specifically that he was to hold short of runway 25R, the pilot assumed he was cleared to cross it and started to taxi onto the runway. His copilot yelled, "STOP!" and stood on the brakes. The pilot looked right and saw a Boeing 747 speeding down the runway. He applied full power to one engine and managed to clear the runway onto the grass, out of the rotating jet's way.

What did the controller mean by "*keep a watch out*"? Possibly he was concerned about wake turbulence from the jumbo jet and wanted the *King Air* to hold well short of runway 25R, but his meaning was unclear.

Once in a while pilots will encounter controllers who use local names that are not on the chart, instead of the usual reference points. "Turn final over Little Creek," might be an example. *Which creek is Little Creek and which is Big Creek?* And supposing there is no creek in sight, only a dry creek bed or two? Local pilots know, of course, but visitors are likely to wind up *up* the creek if they guess.

"The controller is there to provide a helpful service to the public, not to test a pilot's knowledge or question his competence."

The appropriate pilot response to any imprecise advisory is a straight-out question: *What do you mean? Am I to cross runway 25? What was the assigned heading?* Or, *Say again please, I do not understand your language.*

Inexperienced pilots, or those who have never before flown into busy controlled terminals are sometimes intimidated by the pace of ATC communications which they are unable to keep up with. In most cases the controller will recognize the problem and enunciate more slowly. In any event the pilot should never guess or try to anticipate what he cannot clearly understand. The controller is there to provide a helpful service, not to test the pilot's ability or question his competence. If the pace gets too much for a pilot, he can always ask approval to leave the pattern and land at a nearby, less busy airport, where he can sort out his difficulties unhurriedly on the ground.

Intimidation led to problems at Richmond, VA, when a newly certificated pilot arrived over the city for his first visit by air. He was approaching from the northeast, having flown in clear VFR weather from Allentown, PA. About 15 miles out of Richmond, the pilot called Richmond Approach Control, gave his approximate position, and told them his intention to land. The controller told the pilot to maintain his present heading and report "over the Memorial," referring to a prominent feature in Richmond's Civil War Battlefield Park. The pilot was not sure where the memorial was located—it was not on his chart—but he rogered the instructions and kept looking.

As he got closer to the airport without seeing the Memorial, the pilot became concerned but did not admit his doubts to the controller for fear of ridicule. Finally after some circling he located a large white building with fluted columns. Noting that it looked much like other memorials he had seen, he headed for it and informed Richmond he was on target.

"Cherokee 25Z, we don't have you on radar," a puzzled controller radioed, "what does that memorial look like?" A brief description disclosed that the *Cherokee* pilot had been so busy looking for the unfamiliar checkpoint that he had actually flown 15 miles south of Richmond and was circling an antebellum mansion.

Flying with a second pilot who can handle the radio, write down clearances and vectors, inspect charts and scan for landmarks (as well as traffic) while you fly the airplane is one solution to getting safely over the hump of inexperience in a busy environment. If that is not possible, acquire the most convenient knee pad or other means of writing down radioed data. Controlling the aircraft and handling the radio *and* going over charts and checklists can keep both your hands pretty busy, and few of us have mastered the fine art of writing with a pencil in our mouth while talking on the radio.

IFR pilots who often receive a great deal of information in a single transmission find out soon enough that memory alone is not sufficient when a string of numbers is involved. IFR clearances should always be written down, and at least the headings and altitude numbers read back.

When messages are relayed very rapidly, there is always a chance that numbers may be misspoken or misheard, especially when given in conjunction with similar sounding vowels. If you have any doubts, repeat the message, pausing briefly before enunciating each of the numbers. For example, a busy sector controller in a midwest air route traffic control center radioed a corporate jet climbing out at 1800 feet to "climb to two two thousand." Hearing that sentence is much different from reading it: Did the controller mean climb to 2,000 feet or 22,000? The 34-year-old professional pilot queried for clarification after consultation with his copilot. The controller responded, "Roger, climb to two two thousand." The pilot persisted, asking if the controller meant altitude two thousand feet or flight level two two zero (22,000'). The controller then confirmed, "Climb to and maintain flight level two two zero."

The controller may sound busy and you may be a little uptight yourself, but neither of you can afford to make a mistake or rely on guesswork. The system works only when everyone is exactly where he is supposed to be.

It's a game for serious adults. ■

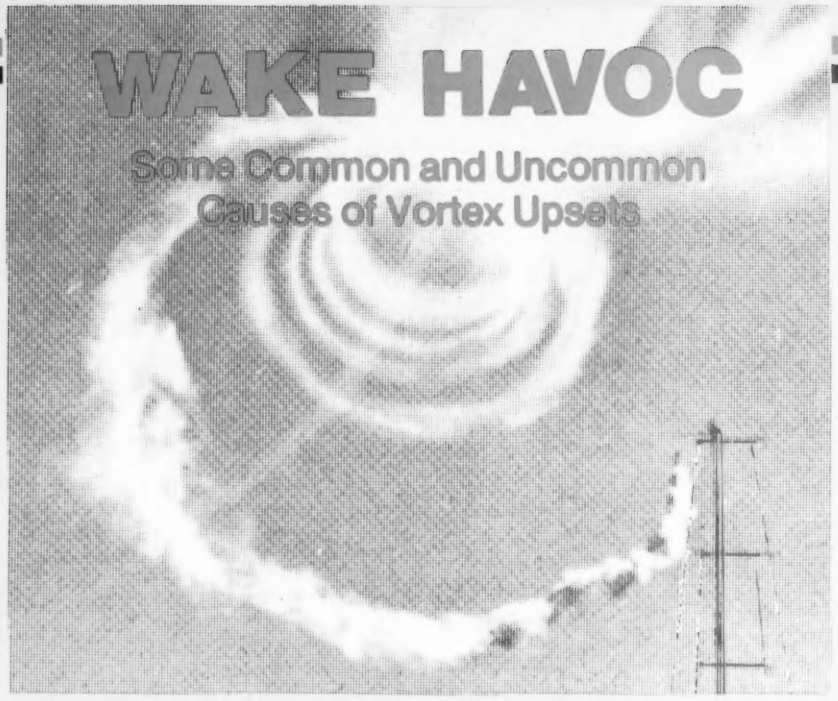
A full discussion of radio terminology is found in the Airman's Information Manual—Basic Flight Information and ATC Procedures, issued semiannually by the Superintendent of Documents, GPO, Washington, DC 20402. The cost is $5.00 ($6.25 foreign) for a yearly subscription.

(Data concerning pilot and controller reports on unsafe conditions was derived from NASA's Aviation Safety Reporting System, a program where anyone can anonymously report to NASA incidents they witnessed or experienced that posed a threat to safe operations.)

"Flying with a second pilot who can handle the radio, write down clearances and scan for landmarks. . . is one solution to getting safely over the hump of inexperience."

WAKE HAVOC

Some Common and Uncommon Causes of Vortex Upsets



Abrupt loss of control as a result of wake turbulence continues to be a danger in the vicinity of airports, especially for light aircraft. Despite the separation procedures in use by air traffic control, and widely publicized information on this subject, approximately 11 accidents per year are attributed to wake turbulence, plus several hundred more "incidents" involving hazardous loss of control but without actually resulting in a reportable accident. A review of the accident and incident data suggests that many pilots are still not really familiar with the cause and effects of this type of turbulence; and that other pilots are overly dependent upon air traffic control to avoid it.

At one time *prop wash* was believed responsible for all turbulence encountered behind aircraft, but later it was learned, through wind tunnel and smoke tests, that the movement of the *airfoil*, not the propeller, is the principal cause. Prop wash and jet exhaust do produce a type of turbulence which can upset smaller aircraft, but this air disturbance is chiefly of concern during ground operations, where airfoil-derived turbulence generally is not a factor.

Wake turbulence is primarily related to *lift* and the size of the airfoil—secondarily to the angle of attack, and inversely to airspeed. The greater the weight of the aircraft being sustained by its airfoil (whether this be a wing or a set of rotor blades), the more intense will be the wake. The longer and broader the airfoil, the greater the area affected.

Pressure from an airfoil in flight causes the air passing over and beneath it to go into a counter-revolving motion on either side of the aircraft. Motion within this revolving air can reach a speed as high as 133 knots, or about 13,444 fpm. The disturbed air continues to revolve, at a gradually abating velocity, for approximately two minutes after passage of the airfoil. When the disturbance takes place at altitude, the turbulent air, visualized as twin-cylindrical in form, descends below the flight path of the aircraft to a maximum distance of about 900 feet, and then remains at a relatively constant altitude until it dissipates. Near the ground, wake turbulence tends to move laterally away from the aircraft's path at a rate of about five knots in no-wind conditions. Wake turbulence is *displaced* laterally and vertically, in a not altogether predictable manner, by all types of wind movement.

The disturbed area is roughly estimated as the length of the airfoil in height and twice that length in width. Although an aircraft of any size—even a wide bodied jet—may be affected by wake turbulence, smaller aircraft are the most vulnerable. The smaller the trailing aircraft, the more likely it is to become completely surrounded by wake turbulence, in conditions that may render the ailerons ineffective.

Separation vs. Sequencing

At tower-controlled airports Air Traffic Control provides wake turbulence separation for small aircraft departing behind heavy and large aircraft. (For purposes of vortex separation, parallel runways less than 2,500 feet apart are considered by ATC as a single runway.) Wake turbulence separation is also provided to aircraft arriving on an IFR flight plan, or to VFR aircraft when radar is used to sequence VFR arrivals. *However, vortex separation is not continued beyond the point where the following IFR pilot accepts a visual approach clearance, or the VFR pilot reports that he has the aircraft he is to follow in sight and is advised by ATC to follow it.*

From this point on the pilot is responsible for maintaining a safe landing interval behind the aircraft ahead. He is expected to monitor the flight path of the preceding aircraft and make certain that his own approach path is safely above or behind it at all times. He is also expected to observe operations on the airport and avoid touching down in an area that could expose him to hazardous wake turbulence created on his runway or on nearby runways.

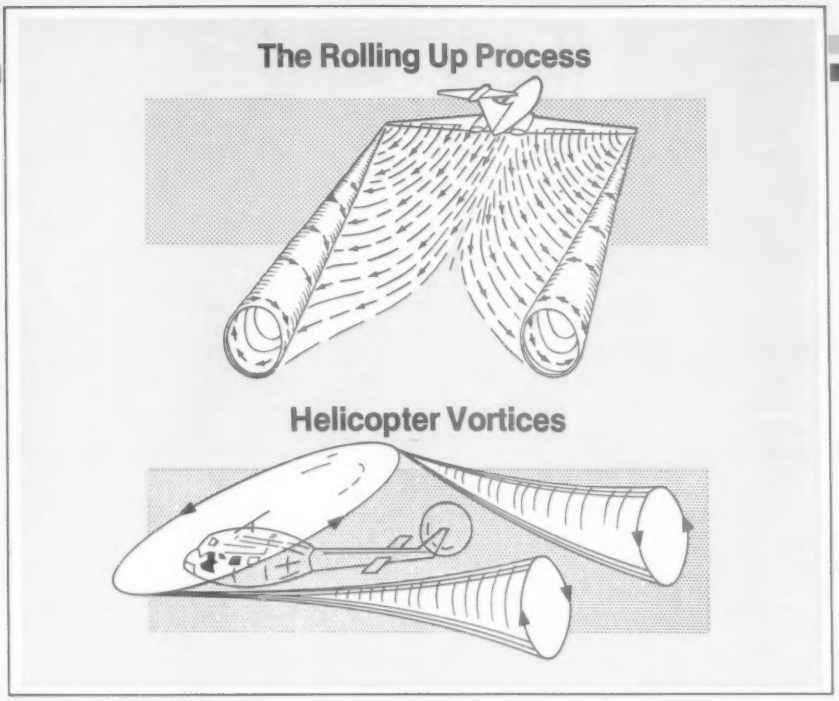
The difference between the terms "sequencing" and "separation" as used by air traffic control must be clearly understood. A landing sequence means the numerical order—". . . Number two to land behind the 727 on final." Sequencing with radar may also involve vectors, headings, or altitudes for the purpose of adjusting the flow of arriving aircraft into the traffic pattern. Separation, on the other hand, means maintaining an established minimum distance (longitudinally, laterally, and vertically) between aircraft.

Any aircraft which, in the opinion of the controller, may be adversely affected by potential wake turbulence of a heavy jet (over 300,000 lbs.) will be issued a *cautionary advisory*. However, this advisory will not necesssarily assist the pilot in avoiding the danger; pilots are expected to know and carry out appropriate procedures—i.e., landing beyond the touchdown point of preceding aircraft, taking off before the rotation point of aircraft ahead, and avoiding crossing under the flight paths of other aircraft with insufficient separation, or taxiing or taking off through an intersection where wake turbulence may still be prevalent.

One situation which has figured in many incidents and some accidents involves the decision on the part of a heavy jet's crew to go around, when another aircraft is preparing to land behind. The go-around configuration of the heavy—gear-up, flaps partially or fully retracted, high angle of attack, full power—will result in the maximum form of wake turbulence, which may persist for several minutes over the entire runway (and any adjacent downwind runway), close to the ground. The pilot of any aircraft close in trail should recognize that in these circumstances he has the option to inform air traffic control he wishes to abort the landing and request a turn or accept any vector which will take him away from the danger area. Even jumbo jet crews have reported severe turbulence when landing behind heavy aircraft that have elected to go-around.

Jumbo Go-Around

Recently a commuter jet was making a descent into Takoma-Seattle Airport behind a jumbo



jet weighing in excess of 530,000 lbs. The jumbo arrived over the approach end of the runway at a higher than normal altitude, whereupon the captain elected to go around. The crew of the commuter jet, which weighted 128,000 lbs., continued their approach in a normal manner at 150 knots with a five mile separation. They descended through smooth air until 200 feet above the threshold, when the commuter was struck by a violent downdraft, resulting in loss of altitude and control. The pilots managed to regain control at 50 feet above ground level and made a satisfactory landing.

Less fortunate were the crew and passenger of a smaller commuter, a Piper *Navajo*, making a visual approach to Philadelphia International Airport on the morning of July 25, 1980. The *Navajo* was sequenced to land behind a Boeing 727 jet making an IFR approach from the south to Runway 27R. The weather was clear with 15 miles visibility, the wind calm. (Wake turbulence is slower to dissipate in no-wind conditions.)

Runway 27R is 9,500 feet, and does not have VASI lights. The airport is situated on flat ground, near the Delaware River. According to the National Transportation Safety Board's report, the commuter was radar identified as it neared the Philadelphia terminal control area, advised to fly a right base leg for Runway 27R, and told they were Number Four to land, following number Three, a B-727 over the Walt Whitman Bridge. A few minutes later the *Navajo* copilot contacted the tower and indicated he had the 727 in sight. The controller cleared the light twin to land at 0711. He stated later that he saw the aircraft on a stabilized approach about one-half mile (out) on final approach, as the preceding 727 jet landed and was turning off the runway. Shortly thereafter the *Navajo* was seen to roll from side to side, pitch up, roll inverted to the left and fly into the ground nose first. The three persons on board died in the crash.

NTSB's investigation determined that the commuter's crew, two experienced and well-trained pilots, had turned their aircraft onto final approach at an altitude of 250 feet below the glide path of the preceding jet, approximately 52 seconds after the 727 had passed this point on the approach.

Uncontrolled Separation

Wake turbulence is also possible at uncontrolled airports where the traffic is frequently a mixture of general aviation and middle-sized commuter aircraft. Some of the commuter airlines have acquired larger aircraft as they took over local feeder lines, and many of these aircraft produce a wake that can easily cause loss of control in light aircraft.

Always a potential victim of wake turbulence is the pilot who flies through an airport control zone without contacting the control tower and without regard for disturbed air from airport operations. In Anchorage, AK the pilot of a Bellanca CBC flew (illegally) through the control zone below an 800 foot broken ceiling without radioing the tower or monitoring inbound traffic. While skirting the airport he flew low enough over the adjoining mud flats to avoid showing up on radar. As he crossed the extended centerline of Runway 6R he apparently encountered severe wake turbulence from a recently arrived DC-10, and entered an uncontrolled descent. The pilot was killed and his passenger hospitalized.

Self Destruction

All aircraft create some degree of wake turbulence which can be upsetting if encountered at peak intensity—some accidents are even attributed to turbulence caused by a circling aircraft running into its own wake.

Normally the slight buffeting experienced by running into one's own wake would not be expected to produce enough turbulence to cause loss of control—unless the aircraft was already on the edge of stalling. However, the phenomenon has been blamed for a number of loss-of-control-at-low-altitude accidents, principally in aerial application, some with fatal consequences.

For example, at Chandler, AZ recently a Gruman G-164 was spraying cotton crops locally in the early morning when the pilot decided to drop a note to his flagman. He did so, at 50 feet above the ground, then executed a slow climbing turn as he looked back to see if the note was picked up. At the 360° point the Grumman rolled past the vertical plane, stalled and crashed in the cotton field. The pilot, who escaped with minor injuries, said that he had insufficient airspeed to counter the buffetting of his "propwash."

Another cotton applicator, flying an *Aero Commander* A98 near Nolan, TX was less fortunate. In this case two spray planes were treating a field at the same time, flying a crosswind swath run in tandem. At the end of one run the lead plane entered a normal turn-around. As the second plane followed with minimal separation, the nose was seen to pitch up sharply and then drop to the ground. The aircraft, recently fueled, burned on impact and the pilot died in the crash. Wake turbulence was suspected as a contributing cause.

In Denton, MT a rancher, flying a PA-18 to check on strays, circled, at a low airspeed over the herd at approximately 200 feet and lost control just as he completed a 360° turn. He was unable to recover the aircraft in time to avert an impact, which caused minor injuries to his spotter passenger and put the pilot in the hospital.

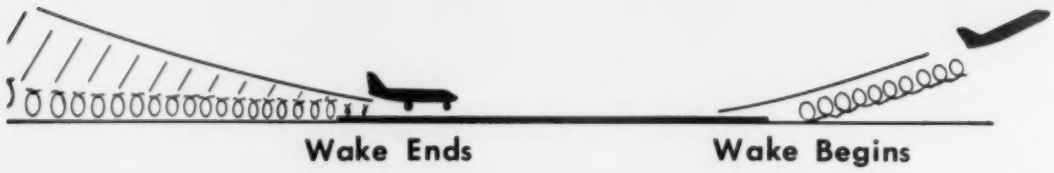
Every pilot should learn to visualize the location of vortices generated by other aircraft and adjust his flight path accordingly, keeping a safe distance behind or above any possible disturbance of air. It is easy to become complacent about wake turbulence because you have to use your imagination to see it. Like many other invisible killers it is colorless, odorless, and noiseless—until it strikes.

See it with your mind's eye and avoid it. ■

For examples of wake turbulence situations, see pages 8 and 9.

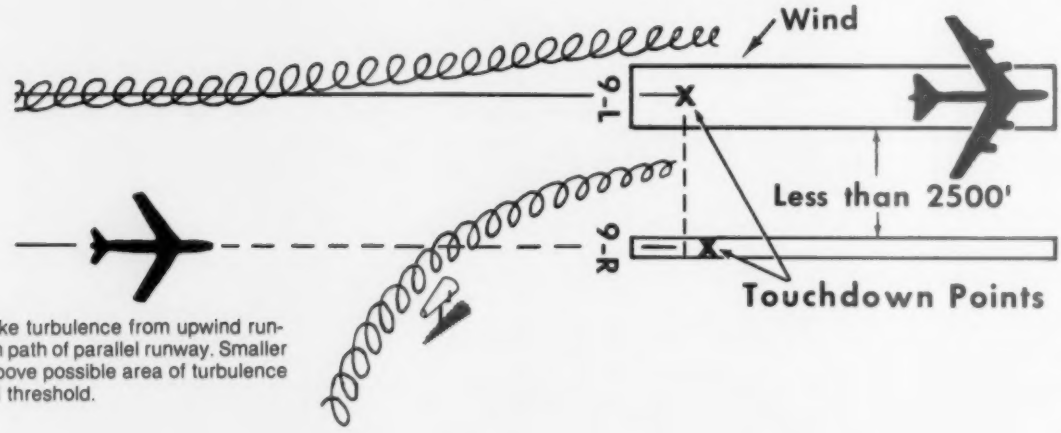
For additional information on this subject see Chapter 6 of AIM, or send for FAA's advisory circular AC-23D (Aircraft Wake Turbulence), free from DOT, Publication Section, M-443.1, Washington, DC 20590.

TOUCHDOWN—ROTATION



Wake turbulence is created only when aircraft are airborne. It begins at rotation, ceases at touchdown.

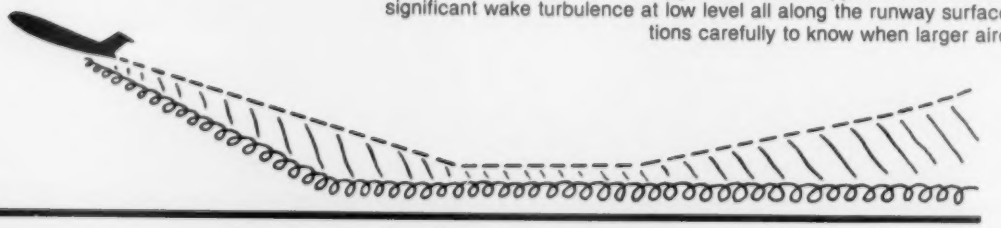
PARALLEL RUNWAYS



Cross wind blows wake turbulence from upwind runway into the approach path of parallel runway. Smaller plane should cross above possible area of turbulence and land well beyond threshold.

LOW MISSED APPROACH

A large or heavy aircraft making a low missed approach or a touch-and-go landing leaves significant wake turbulence at low level all along the runway surface. Monitor communications carefully to know when larger aircraft are going around.

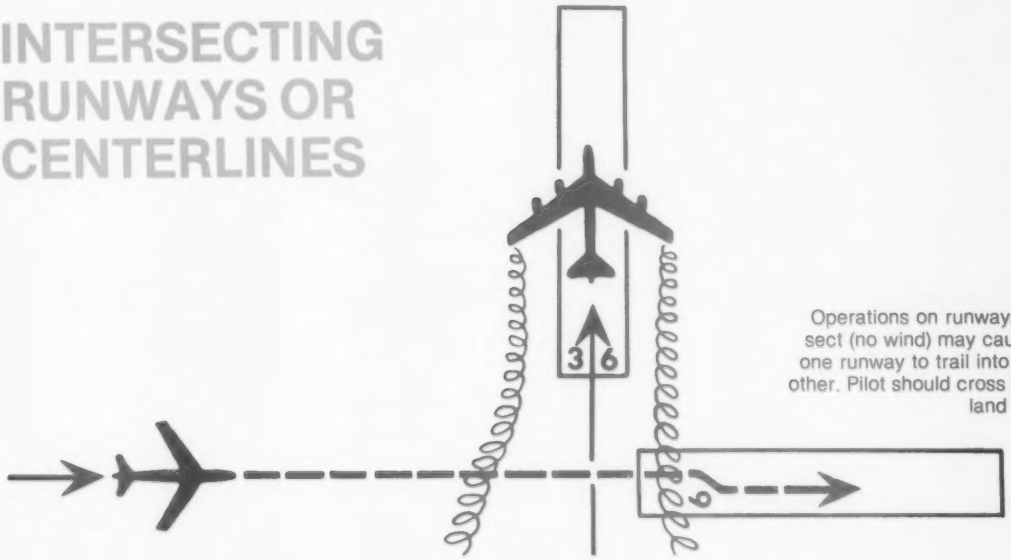


Takeoff or Landing Hazard.

SAME RUNWAY DEPARTURE

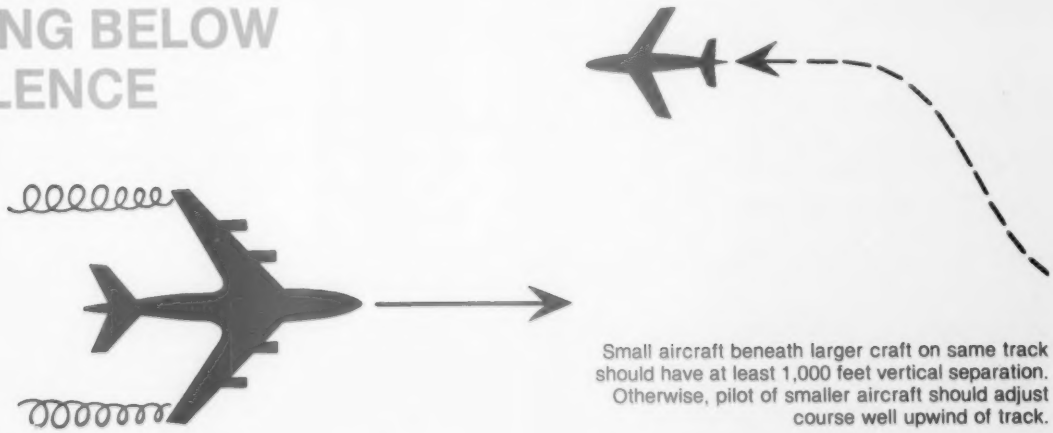
Small aircraft using the same runway as large or heavy airplanes should liftoff *before* the point of the others' rotation—something to remember when requesting an intersection takeoff.

INTERSECTING RUNWAYS OR CENTERLINES



Operations on runways where centerlines intersect (no wind) may cause wake turbulence from one runway to trail into the approach path of the other. Pilot should cross above the turbulence and land further down the runway.

TRACKING BELOW TURBULENCE



Small aircraft beneath larger craft on same track should have at least 1,000 feet vertical separation. Otherwise, pilot of smaller aircraft should adjust course well upwind of track.

THE UNDERLYING CAUSE

When Abstaining from Drugs Can Get You into Trouble

The deadly effect of drugs, including alcohol, on pilots is well known, accounting for approximately 50 accidents each year—most of them fatal. Less understood is the type of accident related to the *abstinence* from drugs, which can also bring on serious incapacitating symptoms, and claim victims without leaving any trace of the cause. Consider the following example.

A young woman who grew up on her parents' farm near Warrenton, in central Virginia, developed a severe allergy to various animals, including dogs, cats, and cattle. Her symptoms were largely respiratory: persistent coughing, sneezing and asthmatic choking, severe enough to require hospitalization before treatment was established. The condition was eventually brought under control by means of an antihistamine prescription drug, taken internally twice a day. There were some predictable side effects, such as drowsiness and lethargy, but the young woman was able to adapt her daily routine to accommodate them.

Later, when she left home for a job in Richmond, she was relieved to find that the allergic condition subsided and she was able to function normally without the drug. This was important to her because she had always been interested in flying, and now she was able to obtain a pilot's certificate and fly regularly.

When she came home at the end of a year for a Christmas holiday, she wanted to use some of her free time to fly at the local airport. In order to avoid the potentially incapacitating effects of her anti-allergy drug she decided not to go back to it but simply to put up with the familiar allergic reactions of being around the farm for the few days she would be there. After two semi-sleepless nights of coughing and sneezing, she came out to the airport and rented a Cessna *Skyhawk* from the fixed base operator.

The operator, after watching her preflight the airplane, suggested that he go up with her for the first half-hour, saying that he wanted to see how good a pilot she had become. They took off and flew to a practice area, where the young woman began to execute power-off stalls. On her second attempt, as the nose of the plane dropped below the horizon and her right hand moved toward the throttle, she somehow found herself lacking the energy to push it in. The alert pilot beside her took over just in time to prevent an incipient spin from developing.

When they talked about the incident later, over some strong coffee in his office, the young woman admitted that after two days of almost continual wheezing and sneezing she was completely worn out. The "uncontaminated" air in the warm cockpit had allowed her to relax, and the desire to close her eyes and finally get some sleep had been overpowering.

The other pilot said that after watching her "sleep-walk" around, while preflighting the airplane, he had suspected she might be a drug user, and had gone up with her out of a sense of concern.

His concern almost certainly saved her life. And if she had been flying alone and succumbed to her weary state, the subsequent accident investigation might have reported the probable cause as ". . . failed to maintain adequate flying speed." There would have been no trace of a drug or any other contributing factor, and no indication that the real failure was a lack of understanding that in situations where medical treatment is called for, abstaining from a prescribed drug in order to fly can be as dangerous as actually flying under the influence of a drug.

Even when the symptoms of a medical condition are not as obvious as they are with many allergies, pilot performance is likely to be affected if the pilot goes off treatment on his own. Flight surgeons, in discussing this subject, speak of the "underlying condition" as being something which cannot be disregarded, since it may be continuously present.

Medical treatment, including drugs, can cause symptoms to subside temporarily without "curing" the underlying condition. Blood pressure can return to normal, chest pains disappear, etc., despite the fact that heart disease is still present. The pilot who suspends treatment on his own and goes back to flying without medical authorization is asking for trouble, whether he has been formally grounded or not.

Even when the pilot is treating himself by means of over-the-counter medicines for "minor aches or pains," suspension of flight activity is strongly recommended by the Federal Air Surgeon. The need for common aspirin or any of the cold remedies is an indication that the pilot is below par, and is likely to score badly on flight performance, especially if he is obliged to deal with an emergency or any unusual circumstances. *Use of any medicine whatsoever while flying may be unsafe*, in view of possible side effects, especially at altitude. But heroically gritting your teeth and disdaining any pills, while attempting to fly with a sharp headache, can be equally dangerous. The headaches could get a lot worse before the flight is over, when the underlying condition is unknown.

Unknowns are out of place in the cockpit. ■

Prepared with the Assistance of Dr. William H. Hark, Chief of Aeromedical Standards Division, Office of Aviation Medicine, FAA.

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Fire in the Cabin

How to Get Down and Out Alive

An inflight fire is one of those rare but nightmarish possibilities that many general aviation pilots have never concerned themselves about. They are aware of the *fire-in-flight* section in the owner's manual, and some pilots may have committed the emergency procedures to memory, but for many aircraft the instructions for coping with the toxic by-products of combustion are necessarily hedged with expressions such as, "*as needed*," or "*as indicated*," or "*if required*," etc. In other words, the emergency conditions themselves are too variable to be dealt with entirely by means of a fixed-order type of procedure. Each manufacturer will issue recommendations for attempting to contain or extinguish the fire, and for getting the airplane down as quickly as possible, but the pilot may have to rely on his judgment in order to cope with smoke or other toxic fumes, which could incapacitate him in a very few minutes and prevent him from landing the airplane safely.

A situation of this kind occurred to the pilot of a twin Rockwell *Commander* on October 4, 1979. An experienced professional who demonstrated and sold aircraft, he was accompanied on the flight from Pensacola, FL to Fort Worth, TX by two prospective clients. About halfway there, cruising at 14,500 feet over Alexandria, LA, the pilot smelled something suspicious in the air. There was nothing to be seen in the cockpit, but as he looked back he saw wisps of smoke curling into the cabin from the air vents. In a few minutes the air was dense with smoke and his two passengers were coughing and sputtering. He had them lie down on the floor as he went through his emergency procedures and started an immediate descent.

At 12,000 feet he depressurized the cabin. However the smoke buildup in the cockpit was so intense that he could no longer read the instrument panel, and he could scarcely breathe. The manufacturer's instructions directed the pilot to go on 100 percent oxygen, but the portable oxygen equipment on the aircraft had been stowed in the cabin, and the pilot did not dare to leave his seat to search for it. He pulled open his side window and managed to stick his head out far enough to breathe in uncontaminated air, and to see ahead. Fortunately the weather was clear, and he could make out open pastures in the farmland below. Behind him he could see 20 foot flames shooting out of the tail section. He knew that literally there was not a second to lose. With his head out of the window much of the time, he brought the aircraft down to an open field about 2,000 feet long, lowered his gear, extended flaps and made a short field landing in heavy grass. The nose wheel collapsed after a short rollout, and the aircraft stopped. The pilot got his passengers out immediately and all three men raced into the nearby woods as the plane was consumed by fire. The cause of the blaze, originally suspected to be the gasoline-fueled cabin heater, was never satisfactorily determined.

A similar situation developed on June 10, 1978, during the flight of a Cessna 172 *Skyhawk* from Charleston to Elkins, WV. The pilot and sole occupant was intending to photograph some real estate near Elkins. The aircraft had a history of problems with the engine oil sump drain that occasionally stuck in the open position, but after repairs it appeared to function normally. However, during the flight, in the vicinity of Hopeville, WV, a slight drop in oil pressure was indicated on the panel. Monitoring the gauges, the pilot saw the pressure continue to drop and the oil temperature rise. He turned back, intending to land at Elkins, about 35 miles distant, but almost immediately experienced a significant loss in power, "like a couple of cylinders weren't firing."

The pilot dialed 7700 into his transponder, idented, and radioed a "Mayday," to which several air traffic facilities responded at once. But within a few seconds both oil pressure and temperature were in the red, engine power was gone and smoke was seen coming out of the engine compartment. The aircraft lost altitude rapidly as flames shot out of the cowling and heavy black smoke entered the cockpit from the firewall. A private field, Canaan Valley, was not very far away, but the fire was so advanced that the pilot, fearing an inflight explosion, elected to "take what was under me"—a rough mountainous terrain with low trees and shrubs. He shut down power and entered on an 80 mph, full flap, spiraling descent. He had opened the air vents but the smoke and other fumes became unbearable, and there was almost no forward visibility. ⟶

In desperation he grabbed the only heavy object he could find, a thermos bottle, and broke out the windshield. By this time he was so close to the ground that he narrowly avoided colliding with a mountain slope. "Hanging on the edge of a stall," he headed for the one small survivable area he could see, a moss-covered hillside which he hoped would absorb some of the impact force. Shortly after touchdown the aircraft groundlooped abruptly, collided with a tree, and came to a stop. The dazed and seriously injured pilot managed to extricate himself from the wreckage and crawl about 75 feet from the crash site before he collapsed. He was rescued by a search and rescue team alerted by the Washington Air Traffic Center.

An even more desperate escape was accomplished by the pilot of a Piper *Pawnee*, who was checking out a newly acquired and overhauled club aircraft when engine fire broke out at 3,000 feet over a wooded area at Boynton, FL. The small cockpit of the single seater aircraft quickly filled with smoke and heat, creating an intolerable environment. The pilot yanked open the canopy, but that intensified the volume of smoke billowing through the cockpit, and flames began to envelope the area. The pilot gathered himself together and leaped over the side, managing to avoid hitting the wing or the tail.

As he happened to have a personal rule always to wear a chute when checking out a recently overhauled aircraft, and as he happened to be an ex-paratrooper with over 300 jumps to his credit, he had little trouble landing safely in a grove of holly trees. Witnesses on the ground who saw him bail out at about 700 feet said that the fabric-covered aircraft appeared to be engulfed in flames from nose to tail.

Not all pilots who experience inflight fires are that lucky. Over the three year period from 1977 through 1979 there were 75 such accidents, of which 20 were fatal (latest available statistics from the National Transportation Safety Board). About one out of three of these fires originated inside the cabin or cockpit, usually from an electrical power source. In most of the fatal accidents the pilot appeared to lose control of the aircraft as a consequence of incapacitating fumes or fire.

Since contemporary pilots do not wear chutes on routine flights, self-protection means taking full advantage of those measures which are normally available. Every aircraft should have an approved fire extinguisher for cabin fires, checked for adequate charge at regular intervals. The extinguisher should be within the pilot's grasp, and he should be capable of utilizing it without leaving his seat. A pair of smoke goggles, conveniently stowed, can also be a lifesaver. (The pilot of the *Commander*, in the first related accident, had to have his eyes treated for two weeks at a hospital, because of smoke exposure.)

As regards the even more serious threat of asphyxiation from smoke inhalation, the pilot has essentially two recourses. He can use supplemental oxygen, if available, or he can open (or demolish) a window. This latter alternative does not always improve the situation and may make it worse, as witness the pilot of the *Pawnee* who had to take to his parachute after opening the canopy. As a general (but not invariable) rule, if the source of the fire is *outside* the cabin, opening vents or windows in the cabin is likely to draw additional smoke and flames toward the crew or passengers. With fires *inside* the cabin, opening vents or windows may help. Pilots of pressurized aircraft must remember to avoid opening windows before depressurization.

With aircraft that are designed to fly over 25,000 feet MSL oxygen supply equipment must be installed, and most emergency procedure lists for cabin fires begin with advising the crew to go on 100 percent oxygen. Aircraft designed to fly at lower altitudes may or may not be required to have supplemental oxygen (depending upon cabin altitude), and their inflight fire procedures may not even mention the use of oxygen. The role of oxygen in supporting combustion is widely known, and there has been virtually no experimentation in the use of portable oxygen units during an inflight fire, either by industry or the FAA.

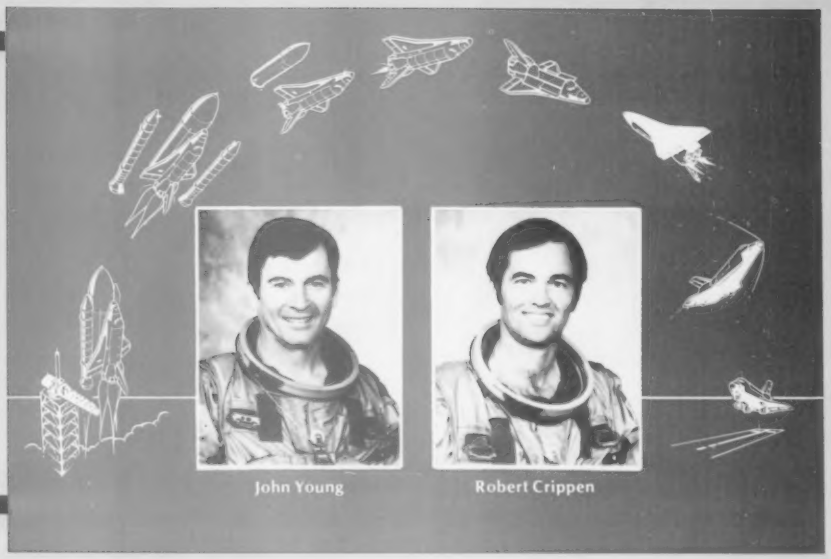
However, experts in the field of toxic fumes at FAA's Civil Aeromedical Institute in Oklahoma City are of the opinion that oxygen leakage from the mask of a properly fitted and used unit would be minimal, and in circumstances where the pilot was faced with imminent smoke asphyxiation the risk of using supplemental oxygen, even from a portable source, might be preferable to the certain consequences of pilot incapacitation. In any event, if there is oxygen on board it should be within easy reach of the pilots, who should be well-practiced in proper utilization, and firmly in the habit of checking the pressure valve of the cylinder. (Beards and moustaches, incidentally, are known to interfere significantly with the sealing capability of the oxygen mask.)

Regardless of the type of inflight fire, there is always a great urgency to get the aircraft down on the ground and evacuate it. There is probably no other flight emergency that is so likely to cause panic and poor judgment in the cockpit. The pilot who has thought the problem through in advance, for his particular aircraft, has the best chance of making the seconds count. Like parachuting, to gain any experience you have to do it right the first time. ■

Supplemental oxygen for possible emergency use to prevent pilot asphixiation should have a tight fitting mask. Beards or wide mustaches can cause oxygen leaks. Most O_2 units have a gauge or light signal indicating charge status of oxygen.

SPACECRAFT COLUMBIA

First Aircraft to Return from Outer Space



As the crow flies 170 miles is no great distance over the earth. Modern jet aircraft can cover it in a few minutes. But flying an airplane 170 miles *above* the earth, free of gravity's hold, and returning home by penetrating the atmosphere at speeds in the range of 17,500 mph is something else.

Like its precursor 78 years ago, the Wright brothers' *Kitty Hawk*, the space shuttle *Columbia* accomplished nothing useful on its first mission on April 12, 1981 other than prove it could be done. Its maiden flight, again like that of the Wright *"Flyer,"* was years in the planning, relatively expensive (about $10 billion), and appeared to have little immediate effect upon the day-to-day lives of ordinary men and women. But just as that little "rag and wood" contraption of the Wrights changed forever the settled nature of terrestrial life, so the *Columbia* has set the stage for the long-fantasied era of manned, controlled space travel. There are now *no* limits to human travel. Buck Rogers lives at last.

Although the *Columbia* has been described as the most complicated piece of machinery ever designed by human beings, as an airplane it is not particularly radical in essential design—less so, in some respects than the supersonic craft which have been in military and commercial service for several years. But it has two distinguishing features that make it unique for a large aircraft: it can fly from space through the earth's atmosphere without burning up, and it can make a safe deadstick landing.

Stripped of its gigantic booster tanks and engines, the *Columbia* has roughly the dimensions of a DC-9—122 foot fuselage, 78 foot wingspan, 200,000 lbs. empty (landing) weight. The cluster of three main engines (470,000 lbs. thrust each) in the tail employ an advanced type of jet propulsion, fueled by a one-to-four mixture of liquified nitrogen and oxygen. They are used only during launch, in conjunction with the two booster rockets and their fuel is entirely exhausted at this time. Directional control is achieved by means of "elevons" (combined ailerons and elevators) and rudder during re-entry from orbit—but these surfaces have little effect in the rarefied air above 70,000 feet. At the upper elevations attitude control (pitch, roll, yaw) is provided by 38 small primary thrusters and six smaller thrusters, or verniers, located forward and aft. Thrust force in orbit is provided by two 6,000 lb. thrust engines in the tail. The orbital maneuvering system engines are gimbaled to swing vertically and laterally. The thruster jets are positioned to point in all directions.

More than 2,000 controls and dials, including every imaginable type of gauge, switch, button, thumb wheel, circuit breaker and hand lever make up the control panel of the *Columbia*.

In command of this juggernaut was John Young, 50, a graduate aeronautical engineer and retired Navy captain who had logged over 8,000 hours in flight, including 587 in spacecraft and four trips into space. His copilot, Robert Crippen, 43, also a Navy pilot and a captain, had 4,090 hours in jets, but had never before traveled in space.

The critical period for the pilots began on the second day in orbit, one hour after the *Columbia* passed over the Indian Ocean on its 36th orbit of the earth, flying at 170 miles over the earth. To break out of orbit, Captain Young used his thrusters to turn the aircraft upside down and tail first, and slowed down his speed with reverse thrust. Once they began their descent he reversed position again, and at 400,000 feet gently nudged the nose into an upraised angle calculated to bring about the desired rate of descent through the earth's atmosphere (approximately 40 degrees above the flight path). They were now at 330,000 feet and the 30,754 miniature silicon tiles that protected them from the friction-induced heat of re-entry were beginning to glow, but the temperature remained normal in the cabin. For 17 minutes they flew in radio silence, as electrified gasses blocked out reception from Houston space center. When communications were restored at 165,000 feet the *Columbia* was right on course, headed for California's Edwards Air Force Base, and reporting no problems.

All engines dead at 32,800 feet, *Columbia* entered the first turn toward the landing strip. The landing at Edwards was to be made on a dry lakebed where a 5.1 mile (27,000 foot) runway was marked off. During the approach the rudder separated laterally to act as a speed brake and slow the aircraft down to touchdown speed—190 knots. Now came the crucial test for Captain Young.

He had practiced the landing many times before, in similar aircraft and in the simulator, but never before in an airplane that had just passed through the earth's entire atmosphere at speeds ranging up to 30 times the speed of sound. U.S. astronauts had made that trip often before, but only in a tiny capsule that had to be parachuted down to the sea. The big question to be settled on this historic day was could a large, complex aircraft make the passage back from outer space essentially unscathed by heat and pressure, and still be landed safely by its pilots without power of any kind? A specially trained rescue crew stood by, ready to rush to their assistance and cut them free of the wreckage if anything went wrong.

Response from the elevons was pinpoint, as Captain Young flared the *Columbia* and settled its wheels down smoothly astride the centerline. It was almost too perfect to be believed. The age of aviation had taken a giant step upwards, and no one could really predict what the consequences might be. Perhaps one day shuttles to other planets would become as commonplace as excursion flights to Los Angeles or Miami and traffic control problems over landing fields on the moon would rival those at New York or Chicago.

All the two pilots could say as they jumped friskily down from their aircraft was what they felt:

"It was beautiful!" ■

FOUR-LEGGED RESCUERS. The American Rescue Dog Association provides trained dogs without charge to aid rescue teams in locating aircraft crash victims. The animals are especially adept at sniffing out persons buried under snow or debris—they have even located bodies deep under water. Fire or service agencies know how to contact the nearest ARDA unit.

LATEST AIRMEN PUBLICATIONS

Part 125

Operators of large aircraft that will be regulated by new Part 125 now have help in complying with its requirements. Advisory circular 125–1, "Operations of Large Airplanes Subject to FAR Part 125," provides regulatory guidance material in the form of answers to the most often asked questions about general aviation use of large aircraft. Free from DOT Publications Section, M-443.1, Washington, DC 20590.

Technical Reports

A list of 107 aviation-related technical reports is now available. The reports cover aircraft and airport safety, aviation medicine, new developments in approach and landing aids, and communications and weather in aviation. Copies of the list may be obtained free from FAA Public Affairs Office, APA–300, 800 Independence Ave., S.W., Washington, DC, 20591.

LETHAL LUGGAGE LOAD

Three accidents have occurred in the past four years—one of them fatal—where loaded guns carried in aircraft baggage discharged accidentally. Responsibility for preventing hazardous cargo of any kind from being carried on an aircraft belongs to the pilot.

Incidently, incapacitating chemicals, such as Mace, also belong in the category of hazardous material.

FOREIGN AIRMEN CERTIFICATION

Foreign pilots or mechanics who desire U.S. certification must present documentary evidence to an FAA inspector showing that they will be employed full time by a company that operates U.S.-registered aircraft.

UNPAVED AIRPORT INDICATORS

FAA's newly proposed marking system for airports with unpaved runways will be tested at four airports with varying terrain features and environments. The low-cost system is currently being tested at three airports in New Jersey, Michigan, and Pennsylvania. Ideally, the new locations will include desert, mountainous, swampy, and heavy snowfall areas.

Interested airport managers should contact Victor Dosch, Chief, Airport Airside Branch, FAA Technical Center, Atlantic City, NJ 08405.

AVON PARK SURVEILLANCE

Increased illegal penetration of the Avon Park Restricted Area in south central Florida has caused FAA to establish special surveillance practices. Inspectors are armed with long range binoculars and cameras to identify intruding aircraft. The clearly delineated area near Avon Park is used by the military for bombing and gunnery practice.

Violation is a dangerous practice that can bring a $1,000 fine and possible action against your airman's certificate.

ODDITIES OF FLIGHT

How far can you fall from an aircraft and not get killed? The record is claimed by a Russian (naturally), a Lt. I.M. Ilyich Chisov who fell out of an Ilyushin bomber in 1942, without a parachute, from an altitude of 22,000 feet. Fortunately, he struck the ground at the edge of a snow-covered ravine. Unfortunately, he slid all the way to the bottom of the ravine, sustaining severe spinal injuries. Fortunately, he survived to tell the tale—and recovered. Estimated airspeed was 117-185 mph.

NOMINATIONS IN ORDER

'Tis the season to honor the outstanding flight instructors and maintenance technicians of the year. Contact your local flight standards or general aviation district office for nomination forms and further details about this program, sponsored jointly by FAA and industry. The deadline for nominations is August 17, 1981.

NATIONAL AIR AND SPACE MUSEUM OPENS NEW JET GALLERY

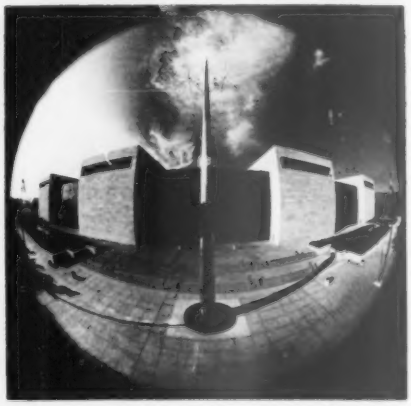
The National Air and Space Museum in Washington, DC, a Mecca for aviation enthusiasts since the doors opened in 1976, is celebrating its fifth anniversary with the addition of a major new exhibit, the Jet Aviation Gallery.

The jet gallery will display restored models of pioneer jets, from the earliest World War II military fighter to the latest homebuilt jet. Backdrop for the display will be a newly completed mural 20′ by 75′, painted by the aviation artist Keith Ferris and including the 25 most significant aircraft produced in the jet age.

Also on exhibition will be a special collection of 22 unusual aviation paintings by leading "photo-realists." (Photo-realism is a recent art style which emphasizes photographic imagery, especially with regard to movement. In some of the paintings fire-breathing *Spitfires* and *Pitt Specials* appear to be flying right off the canvas.)

The official birthday celebration for the National Air and Space Museum will begin on July 1, with free showings of the popular films "To Fly" and "Living Planet," as well as the planetarium presentation, "New Eyes on the Universe." Birthday cake and coffee will be offered all visitors, and free parking will be available in the Museum garage downstairs. Free concerts and workshops in such aviation-related activities as kite and model airplane building will continue until July 5.

All 23 exhibit galleries of this unique aviation museum, covering the history of air and space craft from the 1903 Wright *Flyer* to the Space Shuttle, will be open daily from 10 a.m. to 9 p.m. In five years over 45 million air-minded visitors have attended.



• High Performance or Complex

Thanks for your excellent magazine! It's good to be able to get the facts straight. Another aviation magazine recently published the statement that a checkout in a 230 hp fixed-gear Cessna 182 made you legal to fly a 180 hp *Cutlass RG* and a 285 hp *Bonanza*. I interpret FAR 61.31(e) to require a checkout and endorsement for (1) greater than 200 hp and (2) flaps, retractable gear, and controllable propeller as two independent issues. Who is correct?

Name Withheld

The magazine is correct. FAR 61.31(3) states that a pilot who is qualified for a high performance (greater than 200 hp) or complex (flaps, retractable gear, controllable prop) aircraft may act as PIC in either.

• Not a Wifely Duty

I am a private pilot working on my instrument rating. Can my wife, who is a student pilot, act as my safety pilot when I am flying under the hood?

Name withheld
Great Falls, Mt.

Negative. According to FAR Part 91.21(b)(1), the safety pilot on a simulated instrument flight must be an "appropriated rated" pilot, or one who is qualified to serve as a safety pilot by having a private or better certificate and being rated for the airplane. A student pilot's limited skill level is not sufficient to establish him (or her) as "appropriately rated."

• Move Over, Alice

Thanks for "Alice in Crosswind Land" (January/February 1981), a fine two-page lesson. Students should be taught the advantage of a slip technique on final but also that the stall speed is slightly increased in this configuration, and airspeed must be managed carefully, especially in windshear conditions. With this precaution, I say "good riddance" to the old "kick and a prayer" crab approach. It took a ride through a ground loop and a bent-up taildragger to teach me the virtues of the slip.

Robert W. Locklin
Burlington, VT

• Gyro Stabilized Pilot?

I was very impressed with Mr. Heiner Seidel's idea for a gyro-stabilized chart table in the November/December 1980 issue. However, I think a better approach would be a gyro-stabilized pilot's seat. This would maintain the pilot in the proper orientation to the earth no matter how badly he has let the airplane get away from him—right down to the crash!

Seriously, though, your magazine is great, and it's good to see you have a good sense of humor, too.

Paul H. Albers, Jr.
Massapequa, NY

• How Far Can A Student Go?

Is it correct that a student pilot cannot log as cross-country a flight to an airport less than 50 NM away, even though 25 NM is the limit without cross-country endorsement?

John Armitage
Longmont, CO

In FAR 61.93 cross-country flight is defined as a flight beyond a radius of 25 NM from the point of takeoff. This flight time may be logged as cross-country time. However, since the 25 NM is not in accordance with FAR 61.109, which requires cross-country flights of at least 50 NM from the point of departure, it may not be applied as cross-country time toward a private pilot certificate.

• Simulator and Ground Instruction

I am a flight instructor, and I would like some help in clearing up an interpretation of FAR 61.189(a) concerning training of flight instructors. What is ground instruction meant to be, flight simulator or oral instruction?

Steven A. Briner
Ruston, LA

Ground instruction, or "ground school," is usually interpreted to mean classroom or textbook training in aeronautical knowledge and aircraft systems.

• No Glycerine in Glycol

The article on de-icing (January/February 1981) indicates ethylene glycol is a mixture of alcohol and glycerine. It surely wasn't back in the 1920's when it first came out on the market as an antifreeze. I believe both ethylene glycol and glycerine are alcohols and are related. One compound may change into the other during the manufacturing process but never by mixing.

David H. McGoun
Pensacola, FL

You are correct. Ethylene glycol (also known simply as glycol) is derived from another form of alcohol by a chemical process; glycerine is not part of that process.

• Nix on Pacemakers

I read with interest the letter on "Bypassed Pilots" in the January/February 1981 "Forum." Considering the advances made in modern heart disease treatment with pacemakers, can a pilot who has a demand type pacemaker return to flying under the same conditions as one who has had successful bypass surgery?

Paul R. Simmonds
Jacksonville, FL

Negative, regretfully. Pilots who must rely on cardiac pacemakers continue to have the underlying condition that required insertion of this mechanical device. There is always the possibility that a pacemaker will fail without notice and result in sudden incapacitation. Bypass surgery, on the other hand, is designed to restore normal blood flow to the heart muscle. Although the underlying disease may continue, special diagnostic tests are used to identify serious progression and minimize the risk of sudden incapacitation.

• Calculating Dewpoint

In your January/February 1981 issue the excellent article "Weather Watchers II" contains a minor technical error. The dewpoint is not the temperature read from the wetbulb thermometer. The dewpoint is calculated from the wetbulb temperature and is always less than that reading except in conditions of 100% relative humidity. I hope all these years I have really been hearing the dewpoint and not the wetbulb temperature reported. If this has not been the case, at least the margin of error has been in my favor when anticipating the formulation of fog.

Marvin R. Aly, Jr.
Sherman, TX

Rest easy, your assumption is correct. The dewpoint is calculated from the wetbulb temperatures by reference to a chart.

FAA GENERAL AVIATION NEWS welcomes comments from our readers. No anonymous letters will be used, but names will be withheld on request. Address: FAA GENERAL AVIATION NEWS, AFO-807, Washington, D.C. 20591.

• Belts and Bench Seats

In your answer to Mrs. Joseph's question about children and seat belts (January/February 1981 "Forum"), you indicated each person on board had to occupy a separate seat with a separate seat belt around him. Does this apply to bench seats that are in some older model aircraft as well?

B. E. McLean
Arlington Heights, IL

Separate seats and belts are required for persons two years old and older only in air carrier operations (Part 121) and in passenger operations for certain large, privately owned aircraft (Part 125). In general aviation (Part 91) and commuter operations (Part 135) a safety belt may be used for more than one person in a single seat (such as a bench seat) as long as the strength limits of the seat and safety belt are not exceeded and the aircraft remains within allowable weight and balance limits.

• Instructor Approaches

According to FAR 61.51, an instrument flight instructor can log instrument time while instructing in actual instrument conditions. Does that flight instructor then meet the approach currency requirements of FAR 61.57 if he has given instruction in six approaches within the past six months?

Raymond J. Drozs
Chicago, IL

FAR 61.151 permits a certificated flight instructor to log as PIC the time he acts as a flight instructor. Since instrument approaches are a bonafide part of instrument flight time, the flight instructor may log that time and the approaches toward his currency.

• Instrument PIC Time

Suppose a pilot is applying for an instrument flight test and has the following qualifications: 15 hours instrument flight instruction from an instrument instructor (CFII); 10 hours instrument flight instruction from a flight instructor (CFI); and 15 hours PIC instrument hood time with an IFR-rated safety pilot.

Does he have enough time logged to apply for the rating? Since the application form asks for instrument PIC time, can the pilot log as instrument time the time flown with a safety pilot even though he doesn't have an instrument rating?

John Ross
St. James, NY

Although the airman rating application form provides a space for indicating instrument PIC time, such time is not required for an instrument rating. He may log the 15 hours with the safety pilot as PIC instrument time on the application form, provided he was the sole manipulator of the controls and was rated in the aircraft. In that case,he would appear to have the 40 hours of instrument flight time that is required to apply for the rating.

INSTRUMENT CORNER

• VOR Test via Radar?

Is it permissable under FAR 91.25 to check VOR equipment by ATC confirmation of position along the centerline of a Victor airway or other usable VOR radial in a radar environment? If so what is the maximum permissable error? It seems as though this would be a more accurate method than that described in FAR 91.25(4)(b)—prominent point on an airway.

James T. Fortune
Blacksburg, VA

Negative. The many variables which affect radar accuracy would prohibit its use as an alignment reference. For example, unless the radar and VOR sites were co-located, it would be difficult to apply an error tolerance.

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Fie, fy, fo, fum,

"Tailgating" heavies is kinda dumb.